

Prof. Newton, was reviewed by Strickland in the January number of the 'Annals of Natural History' for 1842 (vol. viii. p. 362), was most likely published in the later months of 1841; and if Bonaparte's "Introduzione" to the Birds was published in the earlier months of the same year, Gray may have had time to see it before the publication of his 'List.'

But, again, how was it that Gray in his 'List' gave to the genus *Chettusia*, Bp., the date 1839? Unless Bonaparte has published that generic name in some other work, which we do not know*, the only explanation I can give is this:—The Dedication of Bonaparte's 'Iconografia' to the Grand Duke of Tuscany, Leopold II., which is placed after the frontispiece of the first volume of the work, is dated 1839†, and most likely Gray took that date for that of the "Introduzione" also.

I think that after all this we may be satisfied that the "Introduzione" to the Birds of Bonaparte's 'Iconografia della Fauna Italica' was published in the same year in which the work was completed, namely in 1841.

Turin, Zoological Museum, April 1888.

XXXIII.—*Notes on the Emperor Penguin* (*Aptenodytes forsteri*). By P. L. SELATER, M.A., Ph.D., F.R.S.

THE interest which I have taken in the proposal to send out another exploring expedition to the Antarctic Seas has induced me to look up what is known of the history of the Emperor Penguin, the giant of the group to which it belongs, and a characteristic form of the little-known Antarctic continent. So far as I can make out, this bird has only been met with on three occasions,—(1) by Cook, in

* Also as regards the genus *Otocorys*, Bp., it is generally stated to have been established in the "Introduzione;" but I have found out quite lately (Cf. 'Elenco degli Uccelli Italiani,' p. 303) that it was proposed in the 'Nuovi Annali delle Sc. Nat.' (Bologna), ii. p. 407 (1839).

† It seems that Bonaparte published the Dedication of his work to the Grand Duke of Tuscany, Leopold II., on the occasion of the Meeting of the Italian Savants held at Pisa, in 1839.

1774-75, during his second voyage, (2) by our Antarctic Expedition in 1840-43, and (3) by the U.S. Exploring Expedition under Commodore Wilkes, in 1840.

Whether any specimens of the Emperor Penguin were brought home from Cook's second voyage I have not been able to ascertain; but a coloured drawing was made, which is now in the unpublished volume commonly called "Forster's *Icones ineditæ*," in the British Museum. This drawing was reproduced by J. F. Miller in his 'Various Subjects of Natural History' (London, 1778), in the second edition of the same work, in which the letterpress was written by Shaw (Miller's 'Cimelia Physica,' London, 1796), and by J. R. Forster, in his well-known article, "*Historia Aptenodytæ*," published in the 'Comment. Soc. Reg. Gottingensis,' in 1781.

Unfortunately, Forster united this Penguin to the "King Penguin," which had been previously described by Pennant as the "Patagonian Penguin" (Phil. Trans. lviii. p. 91), and called it *Aptenodytes patachonica*. It remained thus confounded with its allied form until 1844, when the examination of the specimens brought home by our Antarctic Expedition enabled G. R. Gray to point out conclusively the differences between them (Ann. Nat. Hist. xiii. p. 315). Gray very sensibly remarked that the name "*patachonica*," having been applied to two species, had become no longer of any value as a specific term, and proposed to call the present bird *Aptenodytes forsteri*, and the smaller species (commonly called the "King Penguin") *Aptenodytes pennanti*. Several modern authors, however, under the influence of the craze for "priority," have chosen rather to call the Emperor Penguin *Aptenodytes patachonica**, which, as the bird has never been found in or near Patagonia, is not maintainable, even under the most stringent view of the laws of the Stricklandian code.

The principal synonymy of this Penguin is as follows, so far as I am acquainted with it:—

* Coues, Pr. Acad. Nat. Sc. Phil. 1872, p. 192; Schlegel, Mus. d. P.-B., *Urinatores*, p. 3; and Sharpe, Zool. Erebus & Terror, Suppl., Birds, p. 38.

APTENODYTES FORSTERI.

1778. *Aptenodytes patagonica*, Miller, Various Subjects of Nat. Hist. pl. xxiii.

1781. *Patagonian Pinguin*, Pennant, Gen. of B. p. 66, t. xiv. (not of Phil. Trans.).

1781. *Aptenodytes patachonica*, J. R. Forster, Comm. Soc. R. Sc. Gotting. iii. p. 139, t. ii.

1788. *Aptenodytes patachonica*, Gm. S. N. i. p. 556 (part.).

1790. *Aptenodytes patachonica*, Lath. Ind. Orn. ii. p. 878 (part.).

1796. *Pinguinaria patagonica*, Shaw, in Miller's Cim. Phys. t. xxiii.

1844. *Aptenodytes forsteri*, G. R. Gray, Ann. N. H. xiii. p. 315.

1844. *Aptenodytes patagonica*, Licht. in Forst. Deser. An. p. 347 (part.).

1844. *Aptenodytes forsteri*, G. R. Gray, List of Gall., Grall. & Anseres, p. 156.

1856. *Aptenodytes imperator*, Bp. C. R. Acad. Sc. Paris, xlii. p. 775.

1858. *Aptenodytes patachonica*, Cassin, U.S. Explor. Exp., Birds, p. 349.

1847. *Aptenodytes forsteri*, Ross, Narr. Arct. Exp. ii. p. 159.

1867. *Spheniscus patagonicus*, Schlegel, Mus. d. P.-B. *Urinatores*, p. 3.

1872. *Aptenodytes patagonica*, Coues, Pr. Ac. Nat. Sc. Phil. 1872, p. 192.

1875. *Aptenodytes patachonica*, Sharpe, Zool. Erebus & Terror, Birds, Suppl. p. 38, pl. 31.

1879. *Aptenodyte de Forster*, A. Milne-Edwards, Ann. Sc. Nat. sér. 6, Zool. ix., "Recherches sur la Faune d. Rég. Austr." p. 39.

The specimens of this bird existing in museums and collections are, so far as I know, only nine or ten, namely:—

(1) Six examples in the British Museum, as enumerated in Gray's 'Catalogue of the Gallinæ, Grallæ, and Anseres,' published in 1844 (p. 156). Four of these specimens (three adults and one young) are now mounted in the gallery. The

others are said to be among the skins. There is also a skeleton, of which I shall say something further on. All these specimens were received from the Antarctic Expedition.

(2) A fine mounted specimen in Sir Joseph Hooker's private collection, also procured during the Antarctic Expedition, which, as is well known, he accompanied as Naturalist and Assistant-Surgeon. Sir Joseph informs me, in reply to my inquiries, that this specimen was taken on the Southern Ice-pack in January 1842, in about lat. $65^{\circ} 48' S.$, long. $157^{\circ} 36' W.$, and is one of those referred to in Ross's 'Narrative,' vol. ii. p. 158.

(3) Two stuffed specimens in the Leyden Museum,—one in imperfect plumage, and one young in down (see Schlegel, Mus. d. P.-B. *Urinatores*, p. 3). The origin of these specimens is not stated.

(4) One example in the U.S. National Museum, Washington, obtained during the United States Exploring Expedition. (See Cassin, U.S. Expl. Exp., Mamm. & Orn. p. 349, and Coues, Proc. Acad. Nat. Sci. Philad. 1872, p. 192).

As regards the exact range of the Emperor Penguin, much remains to be learned, but it appears to be now only found on the shores of the Antarctic continent, and probably breeds in the adjacent islands*.

In the time of Cook's voyage it seems to have been met with in South Georgia Island. Forster's drawing (Icon. ined. 81), to which I have referred above, is marked in pencil (probably in his own handwriting) "Jan. 17th, 1775." On reference to George Forster's 'Narrative of Cook's Second Voyage' (vol. ii. p. 528), we find that Tuesday, Jan. 17th, 1775, was the day on which Cook's Expedition landed in South Georgia, and the subjoined account of this Penguin is there given:—

"Here we likewise found a flock of about twenty Penguins, of a much greater size than any we had hitherto seen: they were 39 inches long, and weighed 40 pounds. Their

* In Possession Island (lat. $71^{\circ} 56'$, long. $171^{\circ} 7' E.$) "inconceivable myriads of Penguins completely and densely covered the whole surface" (Ross's Narr. Ant. Exp. i. p. 189).

belly was of a most enormous size, and covered with a quantity of fat. An oval spot of bright yellow or lemon-colour appears on each side of the head, and is edged with black, the rest of the body being of a blackish-grey colour on the whole back and upper side, and white on the belly, under the fins, and all the fore part. These birds were so dull as hardly to waddle from us: we easily overtook them by running, and knocked them down with sticks. When we returned on board we found they were mentioned by that great zoologist, Mr. Pennant, in the 'Phil. Trans.,' by the name of the Patagonian Penguins, and we likewise supposed them to be the same species which the English at the Falkland Islands have named Yellow or King."

It is singular, however, that the Great Penguin found in South Georgia at the present day is said to be not the "Emperor," but the allied "King" Penguin (*A. pennanti**).

In Gray's list of the specimens of *A. forsteri* received by the British Museum from the Antarctic Expedition, localities are attached only in two cases—"d. Female, lat. 77° S., long. 180° E.," and "f. Very young, lat. 64° S." The first of these localities is to the east of Victoria Land, under the great perpendicular ice-barrier; the second cannot be ascertained exactly without the longitude. But in Ross's 'Narrative of the Expedition' (vol. ii. p. 158), we find the following paragraph under date Jan. 11th, 1842, when the Expedition was in 156° W., 66° 65' S., to the east of Victoria Land:—

"During the last few days we saw many of the Great Penguins, and several of them were caught and brought on board alive; indeed it was a very difficult matter to kill them, and a most cruel operation, until we resorted to hydrocyanic acid, of which a tablespoonful effectually accomplished the purpose in less than a minute. These enormous birds varied in weight from sixty to seventy-five pounds. The largest was killed by the 'Terror's' people, and weighed seventy-eight

* Cf. Pagenstecher's "Report on the Birds of South Georgia obtained by the German Polar Commission of 1882-83," in Berich. nat. Mus. Hamburg, 1885, p. 16.

pounds. They are remarkably stupid, and allow you to approach them as near as to strike them on the head with a bludgeon, and sometimes, if knocked off the ice into the water, they will almost immediately leap upon it again, as if to attack you, but without the smallest means either of offence or defence. They were first discovered during Captain Cook's voyage to these regions, and the beautiful unpublished drawing of Forster, the naturalist, has supplied the only figures and accounts which have been given to the public, both by British and foreign writers on natural history. Mr. Gray has, therefore, named it in the 'Zoology' of our voyage, *Aptenodytes forsteri*, of which we were fortunate in bringing the first perfect specimens to England. Some of these were preserved entire in casks of strong pickle, that the physiologist and comparative anatomist might have an opportunity of thoroughly examining the structure of this wonderful creature. Its principal food consists of various species of cancri and other crustaceous animals; and in its stomach we frequently found from two to ten pounds' weight of pebbles, consisting of granite, quartz, and trappean rocks. Its capture afforded great amusement to our people, for when alarmed and endeavouring to escape, it makes its way over deep snow faster than they could follow it; by lying down on its belly and impelling itself by its powerful feet, it slides along upon the surface of the snow at a great pace, steadying itself by extending its fin-like wings, which alternately touch the ground on the side opposite to the propelling leg. The most successful of our hunters were Mr. Oakley and Mr. Abernethy, as they were also in the capture of the seals, which we met with in no great numbers."

Again, on Feb. 5th, 1841, in lat. $77^{\circ} 18' S.$ and long. $193^{\circ} E.$, when the expedition was not far from the South Polar Ice-barrier, we read (Ross's Voy. i. p. 234):—"We saw several of the large Penguins, and three were brought on board; they were very powerful birds, and we had some difficulty in killing them: each of the two larger weighed sixty-six pounds, and the smallest fifty-seven pounds: their flesh is very dark, and of a rank fishy flavour."

The specimen brought back by the U.S. Exploring Expedition was obtained in lat. $65^{\circ} 52'$ S., long. $150^{\circ} 25'$ E., that is, to the west of the spot above mentioned, but not very far away.

On the whole, Victoria Land and adjacent seas may be given as the only present ascertained locality of this bird.

M. A. Milne-Edwards, in his recent article on the Fauna of the Antarctic Regions (Ann. Sc. Nat. sér. 6, Zool. vol. ix.), seems inclined to minimize the specific differences between this species and *A. pennanti*. But I think there can be no doubt that the two birds are quite distinct, as species are usually considered. Besides the size, the external structural differences have been well pointed out by Gray and Coues (*ll. ss. cc.*). The most obvious of them are—(1) The extension of the feathering over the rami of the lower mandible in *A. forsteri*, whereas in *A. pennanti* the sides of the lower mandible are entirely naked. This is at once noticeable in specimens of all ages. (2) The tarsi are feathered in *A. forsteri*, in *A. pennanti* they are naked. (3) The bill in *A. forsteri* is relatively much shorter than in *A. pennanti*.

The differences in coloration of the two species are well shown in the coloured plates in the Zoology of the 'Erebus' and 'Terror.' They are also correctly described by G. R. Gray, as follows :—

A. forsteri.

Yellow of the sides of head passing insensibly into white on the sides of neck, where it is divided by a projecting point of the same colour as the back.

Black under the throat short, and divided in front in the middle by a point of the white feathers of the chest.

A. pennanti.

Yellow of the sides of head deep, and passing at once into deep orange on the chest, gradually becoming white on the breast.

Black under the throat ending in a blunt point on the chest.

In the British Museum I have had an opportunity of making a comparison of examples of the skeletons of these two Penguins which fully substantiate the external differences. As will be seen by the figures (1 and 2, p. 332),

the bill of *A. forsteri* (fig. 2) is much shorter and broader than that of *A. pennanti* (fig. 1).

Fig. 1.



Fig. 2.



Fig. 1.—Upper surface of skull of *A. pennanti*, reduced $\frac{1}{2}$.

Fig. 2.—Corresponding view of skull of *A. forsteri*, reduced $\frac{1}{2}$.

On comparing the two sterna together great differences are at once observable. That of *A. forsteri* (fig. 4, p. 334) is very much longer and broader, and generally larger.

Some of the principal measurements of these bones of the two species are given in the subjoined table:—

	<i>A. forsteri</i> . inches.	<i>A. pennanti</i> . inches.
Total length of the skull from the point of the beak to the base of the occiput	7.0	7.5
Extreme width of the skull between the squa- mosals	2.6	2.4

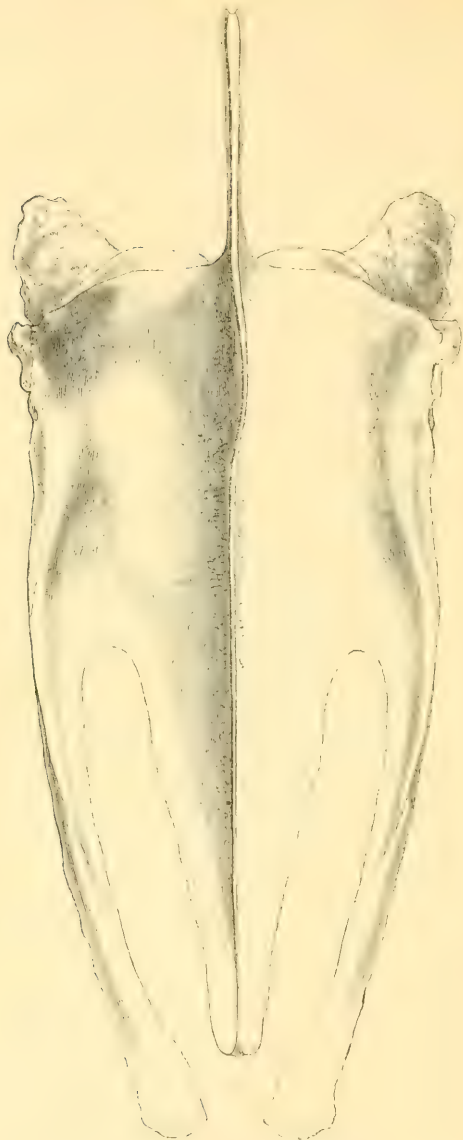
	<i>A. fosteri</i> . inches.	<i>A. pennanti</i> . inches.
Distance from the point of the bill to the proximal end of the nasal bones	3·7	4·5
Extreme length of the <i>carina sterni</i> in a straight line along the ventral margin	10·9	8·2
Extreme length of sternum from the rostral process to the middle point of the posterior border	8·5	6·1

The remaining bones show nearly as great discrepancies on comparison ; in fact, if the skeletons of the two species were only known as fossils, they might well have been referred to different genera.

Fig. 3.

Upper view of sternum of *A. pennanti*, reduced $\frac{1}{2}$.

Fig. 4.

Upper view of sternum of *A. forsteri*, reduced $\frac{1}{2}$.